IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1 – 7. Canceled.

8(Currently Amended). The method of claim [[7]] **17**, wherein the multiple trial values of the weighting constant have values between a minimum eigenvalue and a maximum eigenvalue.

9 – 10. Canceled

11(Currently Amended). The method of claim [[9]] **18**, further comprising:

prior to the receiving step, training the time domain equalizer by performing a plurality of operations comprising:

receiving a training signal over the transmission channel;

locally regenerating a replica training signal;

operating a digital circuit to derive coefficients for a time domain equalizer digital filter from the received and regenerated training signals, by performing a minimization process constrained by a spectral flatness in the frequency domain of the equalizer characteristic; and

storing a filter vector based on the derived coefficients, for use in the time-domain equalizer digital filter.

12(Original). The method of claim 11, wherein the operating operation comprises:

deriving correlation matrices from the received and regenerated signals;

deriving eigenvectors and eigenvalues for a combination of the correlation matrices;

evaluating a cost function including a mean squared error term and a weighted spectral flatness term, the evaluating being performed using the derived eigenvectors and eigenvalues, over multiple trial values of a weighting constant;

selecting a value of the weighting constant that provides a minimum value of the cost function; and

then deriving an optimal filter vector using the selected weighting constant value.

13 – 16. Canceled.

17(New). A method of training a time domain equalizer in a receiving modem, comprising the steps of:

receiving a training signal;

regenerating the training signal in the receiving modem;

operating a digital circuit in the receiving modem to derive coefficients for a time-domain equalizer digital filter from the received and regenerated training signals, by performing a minimization process constrained by a spectral flatness term in the frequency domain of the equalizer characteristic; and

storing a filter vector based on the derived coefficients, for use in a time-domain equalizer digital filter, wherein the operating step comprises:

deriving correlation matrices from the received and regenerated training signals;

deriving eigenvectors and eigenvalues for a combination of the correlation matrices;

evaluating a cost function including a mean squared error term and a weighted spectral flatness term, the evaluating being performed using the derived eigenvectors and eigenvalues, over multiple trial values of a weighting constant;

selecting a value of the weighting constant that provides a minimum value of the cost function; and

then deriving an optimal filter vector using the selected weighting constant value.

18(New). A method of recovering a signal from a transmitted analog signal, comprising the steps of:

receiving, over a transmission channel, an analog signal corresponding to modulated digital symbols in a plurality of frequency subchannels;

analog-to-digital converting the analog signal into a discrete datastream;

applying a time-domain equalizer to the datastream, the time-domain equalizer corresponding to a digital filter having coefficients derived according to a mean-squared error minimization that is constrained according to a spectral flatness;

applying a discrete Fourier transform to the equalized datastream to recover symbols from each of the plurality of subchannels;

applying a frequency domain equalizer to remove a channel response of the transmission channel; and

after the step of applying a time-domain equalizer and before the step of applying a discrete Fourier transform, removing a cyclic prefix from each of a plurality of blocks of symbols in the datastream.

19(New). A transceiver for discrete multitone communications, comprising:

means for receiving a training signal;

means for regenerating the training signal in the receiving modem;

means for operating a digital circuit in the receiving modem to derive coefficients for a time-domain equalizer digital filter from the received and regenerated training signals, by performing a minimization process constrained by a spectral flatness term in the frequency domain of the equalizer characteristic; and

means for storing a filter vector based on the derived coefficients, for use in a time-domain equalizer digital filter, wherein means for operating digital circuit comprises:

means for deriving correlation matrices from the received and regenerated training signals;

means for deriving eigenvectors and eigenvalues for a combination of the correlation matrices;

means for evaluating a cost function including a mean squared error term and a weighted spectral flatness term, the evaluating being performed using the derived eigenvectors and eigenvalues, over multiple trial values of a weighting constant;

means for selecting a value of the weighting constant that provides a minimum value of the cost function; and

means for deriving an optimal filter vector using the selected weighting constant value.

20(New). A transceiver according to claim 19, wherein the multiple trial values of the weighting constant have values between a minimum eigenvalue and a maximum eigenvalue.

21(New). A transceiver comprising:

means for receiving, over a transmission channel, an analog signal corresponding to modulated digital symbols in a plurality of frequency subchannels;

means for analog-to-digital converting the analog signal into a discrete datastream;

means for applying a time-domain equalizer to the datastream, the time-domain equalizer corresponding to a digital filter having coefficients derived according to a mean-squared error minimization that is constrained according to a spectral flatness;

means for applying a discrete Fourier transform to the equalized datastream to recover symbols from each of the plurality of subchannels;

means for applying a frequency domain equalizer to remove a channel response of the transmission channel; and

means for removing a cyclic prefix from each of a plurality of blocks of symbols in the datastream. wherein the cyclic prefix is removed after applying a time-domain equalizer and before applying a discrete Fourier transform.

22(New). A transceiver according to claim 21, further comprising:

means for training the time domain equalizer by performing a plurality of operations, wherein the means for training the time domain equalizer comprising:

means for receiving a training signal over the transmission channel;

means for locally regenerating a replica training signal;

means for operating a digital circuit to derive coefficients for a time domain equalizer digital filter from the received and regenerated training signals, by performing a minimization process constrained by a spectral flatness in the frequency domain of the equalizer characteristic; and

means for storing a filter vector based on the derived coefficients, for use in the time-domain equalizer digital filter.

23(New). A transceiver according to claim 22, further comprising:

means for deriving correlation matrices from the received and regenerated signals;

means for deriving eigenvectors and eigenvalues for a combination of the correlation matrices;

means for evaluating a cost function including a mean squared error term and a weighted spectral flatness term, the evaluating being performed using the derived eigenvectors and eigenvalues, over multiple trial values of a weighting constant;

means for selecting a value of the weighting constant that provides a minimum value of the cost function; and

means for deriving an optimal filter vector using the selected weighting constant value.